

REMARKS

The Examiner has objected to the disclosure stating "The disclosure is objected to because of the following informalities: throughout the specification, there is an 'A' with a line over it followed by a box (e.g. page 5, last sentence of para. 0006). It is believed it should be replaced with the symbol for angstroms: Å. Appropriate correction is required."

In response, Applicants have amended paragraphs [0006], [0008], [0010], [0016], [0017] and [0025]. However, Applicant's copy of both the original word processor file the electronic version filed with the Patent and Trademark Office have the correct symbol for angstroms. Applicants believe the problem may have been caused by a difference in the symbol fonts between the Applicant and Patent Office computers. In case Applicants amendment of paragraphs [0006], [0008], [0010], [0016], [0017] and [0025] is not clear, Applicants authorize the Examiner to make the corrections by Examiners amendment.

The Examiner has stated that claims 2-5 and 15-18 would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims. Applicants gratefully acknowledge the Examiner's indication of allowable subject matter.

In view of the Examiner's earlier restriction requirement, Applicants retain the right to present claims 27-3- in a divisional application.

The Examiner rejected claims 1, 6-14 and 19-26 under 35 U.S.C. 103(a) as being unpatentable over US 4,888,300 to Burton in view of US 5,427,975 to Sparks et al.

Applicants respectfully traverse the §103(a) rejections with the following arguments.

35 USC § 103 Rejections

As to claims 1 and 14, the Examiner states that "Burton teaches in figures 2-13 a method of forming an isolation structure comprising: forming an N-doped region 14 in a substrate etching a vertical trench 20 in the substrate which trench extends into the N-doped region (fig. 2A); laterally etching the N-doped region to form a lateral trench communicating with and extending perpendicular to the vertical trench (fig. 8A); and filling the lateral and vertical trenches with an insulating material "poly" (col. 4, lines 28-35).

Burton does not expressly disclose the method used to form the N-doped region and to form the vertical trench, specifically that they are formed by first and second masking patterns. Sparks teaches, with reference to figures 2a-c, a method of forming an N-doped region 12 and forming vertical trenches comprising two masking patterns. Sparks teaches: forming a first patterned masking layer on a semiconductor substrate 10 whereby a portion of the substrate is exposed through an opening in the first masking layer (see col. 5, lines 45-68); implanting ions into the exposed portion of the substrate to form a buried N-doped region 12 in the substrate (col. 5, lines 59-60); removing the first masking layer (col. 5, lines 67-69) and forming a second patterned layer 16 on the substrate (col. 6, lines 22-34), an opening (generally at 20) in the second masking layer aligning over a less than whole portion of the buried N-doped region; etching a vertical trench in the substrate through the opening in the second masking layer, the trench extending into the N-doped region (as seen in figure 2c); and laterally etching the N-doped region to form a lateral trench communicating with and extending perpendicular to the vertical trench (see again fig. 2c).

At the time of the invention, it would have been obvious to combine Sparks with Burton. The motivation for doing so is that Burton merely indicates that the N-doped layer may be

formed by any conventional method without providing details to do so (col. 3, lines 16-20) while Sparks provides specific steps to achieve the structure needed by Burton. As such, it is considered obvious to obtain the device of instant claims 1, 6-14 and 19-26."

Applicants contend that claims 1 and 14, as amended, are not obvious in view of Burton in view of Sparks et al. because of Burton in view of Sparks et al does not teach or suggest every feature of claim 1. For example, of Burton in view of Sparks et al does not teach or suggest "filling said lateral trench with at least one solid insulating material that does not include semiconductor material and filling said vertical trench with one or more solid insulating materials that do not include semiconductor materials." Applicants respectfully point out that polysilicon is clearly a semiconductor material, and that a void is not a solid material.

Based on the preceding arguments, Applicants respectfully maintain that claims 1 and 14 are not unpatentable over of Burton in view of Sparks et al and are in condition for allowance. Since claims 6-13 depend from claim 1, and claims 19-26 depend from claim 14, Applicants respectfully maintain that claims 6-13 and 19-26 are likewise in condition for allowance.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invite the Examiner to contact the Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 09-0456.

Respectfully submitted,
FOR:

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